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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/635,311

08/06/2003

Timothy R. Armstrong

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05/10/2006

UT-Battelle, LLC

Office of Intellectual Property

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EXAMINER

HANDAL, KAITLY V

ART UNIT

PAPER NUMBER

1764

DATE MAILED: 05/10/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/635,311

Applicant(s)

ARMSTRONG ET AL.

Examiner

Kaity Handal

Art Unit

1764

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) 8-22 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-22 are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 8/6/2003.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-18, drawn to apparatus, classified in class 422, subclass 129.
- II. Claims 19-22, drawn to method, classified in class 48, subclass 197R.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another and materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the apparatus as claimed can be used to practice another and materially different process, one which does not require the reformate to a fuel cell.

Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

Because these inventions are independent or distinct for the reasons given above and the inventions require a different field of search (see MPEP § 808.02), restriction for examination purposes as indicated is proper.

During a telephone conversation with Mr. Kirk Wilson on 3/27/2006 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-18. Affirmation of this election must be made by applicant in replying to this Office action.

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Claims 19-22 are withdrawn from further consideration by the examiner, 37

CFR 1.142(b), as being drawn to a non-elected invention.

2. This application contains claims in Group I invention directed to the following patentably distinct species:

I. This application contains claims directed to the following patentably distinct species of the compact fuel feed processing system.

I-a Figure 2 – System having a reformer /heat exchanger/ scrubber/ and a fuel cell.

I-b Figure 3– System having a conventional reformer /heat exchanger/ scrubber/ and a conventional fuel reformer.

I-c Figure 4– System having a pre-scrubber/ reformer /heat exchanger/ scrubber/ and a fuel cell.

Applicant is required under 35 U.S.C. 121 to elect a single disclosed species (either I-a or I-b or I-c) for prosecution on the merits to which the claims shall be restricted if no generic claim is finally held to be allowable. Currently, none of the claims appear to be generic.

Applicant is advised that a reply to this requirement must include an identification of the species that is elected (either I-a or I-b or I-c) consonant with this requirement, and a listing of all claims readable thereon, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered nonresponsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which depend from or otherwise require all the limitations of an allowable generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species.

MPEP § 809.02(a).

During a telephone conversation with Mr. Kirk Wilson on 5/5/2006 a provisional election was made without traverse to prosecute the invention of I-a (Figure 2), claims 1-7. Affirmation of this election must be made by applicant in replying to this Office action. Claims 8-18 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Specification***

Abstract is objected to by examiner.

Applicant is reminded of the proper content of an abstract of the disclosure.

A patent abstract is a concise statement of the technical disclosure of the patent and should include that which is new in the art to which the invention pertains. If the patent is of a basic nature, the entire technical disclosure may be new in the art, and the abstract should be directed to the entire disclosure. If the patent is in the nature of an improvement in an old apparatus, process, product, or composition, the abstract should include the technical disclosure of the improvement. In certain patents, particularly

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those for compounds and compositions, wherein the process for making and/or the use thereof are not obvious, the abstract should set forth a process for making and/or use thereof. If the new technical disclosure involves modifications or alternatives, the abstract should mention by way of example the preferred modification or alternative.

The abstract should not refer to purported merits or speculative applications of the invention and should not compare the invention with the prior art.

Where applicable, the abstract should include the following:

- (1) if a machine or apparatus, its organization and operation;
- (2) if an article, its method of making;
- (3) if a chemical compound, its identity and use;
- (4) if a mixture, its ingredients;
- (5) if a process, the steps.

Extensive mechanical and design details of apparatus should not be given.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 5-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 5-6 recite the limitation "catalytic fuel reactor" in line 1. There is insufficient antecedent basis for this limitation in the claim.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

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(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1 and 5-6 are rejected under 35 U.S.C. 102(b) as being anticipated by Bonville, Jr. et al. (US 6,156,084).

With respect to claim 1, Bonville teaches fuel cell (fig. 1, 55) feed processing system comprising: A fuel reformer (20) further comprising a means/pump (4) for introducing gaseous fuel (illustrated) and means/line (78) for introducing air into said reformer (20), said reformer is a steam reformer (as illustrated); a heat exchanger (24) communicably connected to said fuel reformer (20), and a scrubber (52, 50, 44) communicably connected to said heat exchanger (24) and further comprising a means/line (54) for passing scrubbed reformat from said scrubber (52, 50, 44); wherein said reformer (20), said heat exchanger (24), and said scrubber (52, 50, 44) are communicably connected in series (illustrated) so that gaseous material may pass through said reformers said heat exchanger and said scrubber sequentially.

With respect to claim 5, Bonville teaches wherein said catalytic fuel reactor/reformer (20) is located at a point of fuel supply (illustrated in having the fuel pump (4) in the vicinity of the reformer (20)).

With respect to claim 6, Bonville teaches wherein said catalytic fuel reactor/reformer (20) is located at a point of fuel usage (illustrated in having the fuel cell (55) as part of the apparatus).

***Claim Rejections - 35 USC § 103***

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7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 2-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bonville, Jr. et al. (US 6,156,084) as applied to claim 1 above, and further in view of Hayes (US 5,709,914).

With respect to claims 2-3, Bonville discloses all claim limitations as set forth above but fails to show wherein said heat exchanger comprises graphitic carbon foam. Hayes teaches a heat transfer device (matrix 12) comprising carbon foam (col. 3, lines 18-23) in order to provide a heat exchanger having a high specific heat (col. 5, lines 9-12) thereby providing a cooling effect (col. 5, line 67 – col. 6, lines 1-15).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a heat exchanger comprising graphitic carbon foam in Bonville's apparatus, as taught by Hayes, in order to provide a high specific heat heat-exchanger thereby providing a cooling effect.

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bonville, Jr. et al. (US 6,156,084) as applied to claim 1 above, and further in view of Wilson et al. (US 5,827,355).



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With respect to claim 4, Bonville teaches the need to convert carbon monoxide through placing scrubbers/selective oxidizers (50 and 54 as illustrated in figure 1), however, he fails to teach wherein said scrubbers comprise carbon fiber composite molecular sieve material. Wilson teaches removing carbon monoxide in industrial applications using carbon fiber composite molecular sieve material (col. 4, lines 35-48) in order to achieve low concentration of gaseous pollutants including carbon monoxide (col. 5, lines 33-40).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include a scrubber comprising carbon fiber composite molecular sieve material in Bonville's apparatus, as taught by Wilson, in to achieve low concentration of gaseous pollutants including carbon monoxide.

10. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bonville, Jr. et al. (US 6,156,084) as applied to claim 1 above, and further in view of Asou et al. (US 2002/0150800 A1).

With respect to claim 7, Bonville discloses all claim limitations as set forth above but fails to show wherein apparatus has a means for recycling gases from said scrubber to said reformer wherein said recycled gases are selected from at least one of the group consisting of carbon monoxide and methane. Asou teaches a hydrogen generator comprising a reformer (fig. 1, 3) and a carbon monoxide scrubber/purifying unit (5) comprising a means/valve (6) for recycling gases from said scrubber/purifying unit (5) to said reformer's (3) burner (8) (as illustrated) wherein

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said recycled gases are selected from at least one of the group consisting of carbon monoxide and methane/generated gas (generated gas would naturally contain a percentage of non purified carbon monoxide since no purification device perform at 100% efficiency) in order to supply gas to the reformer's burner (as illustrated) (page 1, paragraph [0003], lines 1-14).

It would have been obvious to one having ordinary skill in the art at the time the invention was made to include in Bonville's apparatus a means for recycling gases from said scrubber to said reformer wherein said recycled gases are selected from at least one of the group consisting of carbon monoxide and methane, as taught by Asou, in order to supply gas to the reformer's burner.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kaity Handal whose telephone number is (571) 272-8520. The examiner can normally be reached on M-F 8-5.

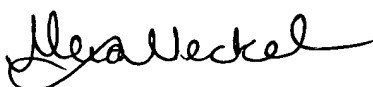
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571) 272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

KH  


5/5/2006

  
ALEXA DOROSHENK NECKEL  
PRIMARY EXAMINER